

| N A S A |

| N A S A |

U S L / D B M S N A S A / R E C O N
W O R K I N G P A P E R S E R I E S

Report Number

DBMS.NASA/RECON-2

The USL/DBMS NASA/RECON Working Paper Series contains a collection of reports representing results of activities being conducted by the Computer Science Department of the University of Southwestern Louisiana pursuant to the specifications of National Aeronautics and Space Administration Contract Number NASW-3846. The work on this contract is being performed jointly by the University of Southwestern Louisiana and Southern University.

For more information, contact:

Wayne D. Dominick

Editor
USL/DBMS NASA/RECON Working Paper Series
Computer Science Department
University of Southwestern Louisiana
P. O. Box 44330
Lafayette, Louisiana 70504
(318) 231-6308

| DBMS.NASA/RECON-2 |

| WORKING PAPER SERIES |

(NASA-CR-184510) NASA RECON: COURSE
DEVELOPMENT, ADMINISTRATION, AND EVALUATION.
A RESEARCH AND DEVELOPMENT EFFORTS Final
Report, 1 Jul. (University of Southwestern
Louisiana. Lafayette. Center for Advanced

N89-14950

Unclass
G3/82 0183548

4.3

1. Report No. <i>IN</i>	2. Government Accession No. <i>183548</i> ~~447398~~	3. Recipient's Catalog No.	
4. Title and Subtitle USL/NGT-19-010-900: NASA RECON: COURSE DEVELOPMENT, ADMINISTRATION, AND EVALUATION <i>67P.</i>		5. Report Date <i>DATE</i> May 1983 <i>OVERRIDE</i>	6. Performing Organization Code
		8. Performing Organization Report No.	
7. Author(s) WAYNE D. DOMINICK AND LEROY ROQUEMORE		10. Work Unit No.	
9. Performing Organization Name and Address University of Southwestern Louisiana The Center for Advanced Computer Studies P.O. Box 44330 Lafayette, LA 70504-4330		11. Contract or Grant No. NGT-19-010-900	
		13. Type of Report and Period Covered FINAL; 07/01/85 - 12/31/87	
12. Sponsoring Agency Name and Address		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract Working Paper Series entry representing the scope of the initial contract proposal to NASA. This report represents one of the 72 attachment reports to the University of Southwestern Louisiana's Final Report on NASA Grant NGT-19-010-900. Accordingly, appropriate care should be taken in using this report out of the context of the full Final Report.			
17. Key Words (Suggested by Author(s)) NASA/RECON Contract Proposal, Information Storage and Retrieval Systems		18. Distribution Statement	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 65	22. Price*

NASA RECON:
COURSE DEVELOPMENT, ADMINISTRATION, AND EVALUATION

A Research & Development Proposal

Submitted to:

The National Aeronautics and Space Administration

by

The University of Southwestern Louisiana
Computer Science Department
Lafayette, Louisiana

&

Southern University
Department of Computer Science
Baton Rouge, Louisiana

May 1983

NASA RECON:
COURSE DEVELOPMENT, ADMINISTRATION, AND EVALUATION

ABSTRACT

This research and development proposal addresses the development, administration, and evaluation of a set of transportable, college-level courses to educate science and engineering students in the effective use of automated scientific and technical information storage and retrieval systems, and, in particular, in the use of the NASA RECON system.

After a brief introduction to the research and development area in Chapter I, Chapter II identifies the general and specific objectives for this project, with objectives being categorized as needs analysis objectives, course development objectives, course administration objectives, and course evaluation objectives. Chapter III then proposes the methodology to be employed in successfully accomplishing these objectives; Chapter IV highlights the expected results and product deliverables of this project; and Chapter V presents the project evaluation plan to be followed in evaluating all activities and deliverables proposed within this project.

Chapter VI presents a brief overview of the institutional resources available at the proposing institutions, namely, at the University of Southwestern Louisiana and at Southern University, to support this project. Chapter VII presents the proposed project budget, time schedule, and project management plan for this project, and Chapter VIII summarizes the proposed project. Finally, resumes of the Co-Principal Investigators for this project are provided in the appendices to this proposal.

We believe this to be a sound and very timely research and development proposal whose results should be extremely beneficial within both current and future NASA scientific and technical information environments.

TABLE OF CONTENTS

	Page
I. INTRODUCTION	5
II. PROJECT OBJECTIVES	8
2.1 General Objectives	8
2.2 Specific Objectives	9
2.2.1 Needs Analysis Objectives	9
2.2.2 Course Development Objectives	10
2.2.3 Course Administration Objectives	12
2.2.4 Course Evaluation Objectives	13
III. PROPOSED PROJECT METHODOLOGY	15
IV. EXPECTED PROJECT RESULTS AND DELIVERABLES	18
V. PROJECT EVALUATION PLAN	20
VI. OVERVIEW OF INSTITUTIONAL RESOURCES	22

VII. PROPOSED PROJECT BUDGET, TIME SCHEDULE, AND PROJECT MANAGEMENT PLAN	27
7.1 Budget	27
7.2 Time Schedule	31
7.3 Project Management Plan	33
VIII. SUMMARY OF PROPOSED PROJECT	35
APPENDICES - RESUMES OF CO-PRINCIPAL INVESTIGATORS & STANDARDIZED DOCUMENTATION TEMPLATES	
A. USL Co-Principal Investigator: Wayne D. Dominick . . .	37
B. SU Co-Principal Investigator: Leroy Roquemore	56
C. Standardized Course Material Documentation Templates .	60

I. INTRODUCTION

There appears to be a growing realization that recent college graduates in scientific and engineering disciplines do not have the experience, skills, and motivation necessary to take full advantage of existing, automated systems which provide capabilities for searching and retrieving scientific and technical information.

Massive data bases of bibliographic information are currently available and accessible via online, interactive systems. For example, the NASA RECON system provides such access to a variety of document series including, among others:

- * Scientific and Technical Aerospace Reports (STAR)
- * Limited Scientific and Technical Aerospace Reports (LSTAR)
- * International Aerospace Abstracts (IAA)
- * NASA Research and Technology Operating Plan Summary (RTOPS)
- * Computer Program Abstracts (CPA)
- * NASA Library Collection.

This research and development proposal addresses the development, administration, and evaluation of a set of transportable, college-level courses to educate science and engineering students in the effective use of automated scientific and technical information storage and retrieval systems, and, in

particular, in the use of the NASA RECON system.

As a result of the successful completion of this project, we would expect that a number of highly significant benefits would accrue to NASA:

- (1) Graduate from colleges and universities sponsoring such courses would have gained the experience, skills, and motivation necessary for the effective use of automated research support systems and of the NASA RECON system in particular and hence would be readily suitable to work with NASA. Such prior experience should have a positive effect on the quality of research conducted by incoming NASA employees and should minimize required training time by NASA in such areas.
- (2) NASA's sponsorship of such courses should provide much greater visibility for NASA in colleges and universities where NASA would be likely to recruit.
- (3) Having research faculty in science and engineering at colleges and universities become familiar with RECON and with NASA bibliographic data bases should facilitate contract research between NASA and such colleges and universities.

In order to ensure the success of this project, this proposal is being submitted jointly by the University of Southwestern Louisiana (a university with a very strong, proven track record in Computer Science research and development, especially in the area of computer-based information system) and Southern University (a developing institution with serious interests in enhancing its research capabilities in Computer Science).

Based upon the historical support which the Computer Science Department at USL has provided to Southern University to expedite the development of Computer Science curricula, graduate programs, faculty capabilities, and research competencies at Southern University, this joint research and development proposal is felt to be in complete concert with the aims of the National Aeronautics and Space Administration with respect to support for developing institutions.

II. PROJECT OBJECTIVES

The intent of this chapter is to define the set of project objectives which will structure and direct all of the activities to be performed within the scope of this proposed project. Project objectives are first stated in general terms in Section 2.1 and then refined into specific project objectives in Section 2.2.

2.1 General Objectives

The general objectives identified for this proposed project are as follows:

- (1) General Needs Analysis Objective: The conduct of a thorough needs analysis to ascertain the specific needs of target scientific and engineering institutions with respect to the availability of transportable courses addressing automated scientific and technical information storage and retrieval systems, in particular, the NASA RECON system.
- (2) General Course Development Objective: The complete development of a set of transportable courses addressing automated scientific and technical information storage and

retrieval systems in accordance with institutional needs as identified within objective (1) above.

- (3) General Course Administration Objective: The pilot administration/teaching of the courses developed within objective (2) above on-site at the proposing institutions.
- (4) General Course Evaluation Objective: The comprehensive evaluation of each activity performed and each deliverable produced within the scope of this project.

2.2 Specific Objectives

The following four sub-sections of this chapter will define the specific project objectives for each of the four general project objectives identified within Section 2.1 above.

2.2.1 Needs Analysis Objectives

The specific project objectives associated with the General Needs Analysis Objective identified as general objective (1) in Section 2.1 are as follows:

- (1) Identify the target scientific and engineering institutions to be surveyed. It is expected that such institutions

represent current and possibly potential future users of RECON:

- (2) Develop a needs identification questionnaire to be administered at the identified target institutions.
- (3) Administer the needs identification questionnaire.
- (4) Summarize and analyze the questionnaire results and identify implications of needs analysis results to course development activities.
- (5) Prepare an interim report (Interim Report No. 1) summarizing the results of the Needs Analysis phase of the project and submit this report to the NASA contract monitor for review.

2.2.2 Course Development Objectives

The specific project objectives associated with the General Course Development Objective identified as general objective (2) in Section 2.1 are as follows:

- (1) Based on the results of the needs analysis phase of the project, determine specific details associated with course(s) design, content, and duration.

In light of potential diversity of needs across different institutions, it is expected that there may well be the need for developing a set of courses (rather than a single course). For example, there may well be the need for developing each of the following courses in an integrated manner:

- (a) A full semester course (approximately 18 weeks duration, 3 hours/week) addressing both the principles of interactive scientific and technical information storage and retrieval systems and integrating numerous examples utilizing RECON across a variety of scientific and engineering disciplines.
- (b) A mini course (approximately 6 weeks duration, 3 hours/week) highlighting selected search and retrieval principles and illustrating such principles utilizing RECON examples across selected scientific and engineering disciplines.
- (c) A brief, intensive workshop (1-2 day duration) presenting and illustrating the most important commands and capabilities of RECON.

Throughout the remainder of this proposal, it will be assumed that an integrated set of courses similar to those presented above will need to be developed.

- (2) Complete development of all transportable course materials for the integrated set of courses identified within objective (1) above. For each such course, this will require development of the following materials:
- (a) Course syllabus.
 - (b) Course lesson plans.
 - (c) RECON homework assignments.
 - (d) RECON homework assignments - answer keys.
 - (e) RECON usage assignments.
 - (f) RECON usage assignments - answer keys.
 - (g) Course examinations.
 - (h) Course examinations - answer keys.
 - (i) Course visuals (transparencies).
- (3) Prepare an interim report (Interim Report No. 2) summarizing the results and deliverables of the Course Development phase of the project and submit this report to the NASA contract monitor for review.

2.2.3 Course Administration Objectives

The specific project objectives associated with the General Course Administration Objective identified as general objective (3) in Section 2.1 are as follows:

- (1) Perform all required university administrative protocol functions associated with the offering of new courses, e.g., prepare course descriptions and announcements, coordinate course scheduling and facility reservations, perform prospective student advisement, and the like.
- (2) Perform all activities associated with the actual teaching of the courses, e.g., lecturing, RECON demonstrations, grading assignments and examinations, maintaining course office hours, advising students, scheduling special sessions and RECON demonstrations as required, and the like.
- (3) Prepare an interim report (Interim Report No. 3) summarizing the results and deliverables of the Course Administration phase of the project and submit this report to the NASA contract monitor for review. Depending on the scheduling of the offerings of the different courses, there may well be a series of Interim Report No. 3 documents, with each document corresponding to one offering of a course.

2.2.4 Course Evaluation Objectives

The specific project objectives associated with the General Course Evaluation Objective identified as general objective (4) in Section 2.1 are as follows:

- (1) Perform a comprehensive evaluation of the activities, results, and deliverables associated with the Needs Analysis phase of the project. This evaluation will be incorporated within Interim Report No. 1 as referenced within Section 2.2.1.
- (2) Perform a comprehensive evaluation of the activities, results, and deliverables associated with the Course Development phase of the project. This evaluation will be incorporated within Interim Report No. 2 as referenced within Section 2.2.2.
- (3) Perform a comprehensive evaluation of the activities, results, and deliverables associated with the Course Administration phase of the project. This evaluation will be incorporated within Interim Report No. 3 as referenced within Section 2.2.3.
- (4) Perform a comprehensive evaluation of the activities, results, and deliverables associated with the project in its entirety. Together with a summary of all such activities, results, and deliverables, this final comprehensive evaluation will constitute the Final Report of the project.

As an expansion of these evaluation objectives, Chapter V presents the proposed project evaluation plan.

III. PROPOSED PROJECT METHODOLOGY

In the interests of brevity, this chapter will address only selected components of the proposed methodology for this project.

In particular, since the needs analysis phase of this project (see Section 2.2.1, entitled "Needs Analysis Objectives") will utilize standard needs analysis and survey questionnaire techniques, no additional discussion of methodology for that phase will be presented in this chapter. Additionally, since the course administration phase of this project (see Section 2.2.3, entitled "Course Administration Objectives") will parallel contemporary teaching/administrative techniques for courses providing hands-on experience with online, interactive information systems, again, no additional discussion of methodology for that phase will be presented in this chapter. Finally, since the course evaluation phase of this project (see Section 2.2.4, entitled "Course Evaluation Objectives") will be addressed within Chapter V, entitled "Project Evaluation Plan", no additional discussion of methodology for that phase will be presented in this chapter.

This chapter will, thus, focus on selected components of the course development phase of this project (see Section 2.2.2,

entitled "Course Development Objectives).

The primary objective of the course development phase is the complete development of all transportable course materials for the integrated set of courses to be developed (again, see Section 2.2.2 for an identification of the expected set of courses to be developed).

Within this context, a set of standardized course material documentation templates will be employed in order to ensure standardization between the proposing institutions during course development and administration, and in order to ensure transportability of all course deliverables to other institutions. This methodological approach has proven eminently successful in previously funded work of the USL Co-Principal Investigator on this project in similar environments, in particular, in Department of Defense funded work in the area of transportable college-level course development.

Standardized course material documentation templates will be utilized across all of the following course materials:

- (a) Course syllabus.
- (b) Course lesson plans.
- (c) RECON homework assignments.
- (d) RECON homework assignments - answer keys.
- (e) RECON usage assignments.
- (f) RECON usage assignments - answer keys.
- (g) Course examinations.
- (h) Course examinations - answer keys.
- (i) Course visuals (transparencies).

Examples of these standardized course material documentation templates can be found in Appendix C of this proposal.

IV. - EXPECTED PROJECT RESULTS AND DELIVERABLES

The expected results and deliverables of this project correspond to the expected successful completion of each of the specific project objectives identified within Sections 2.2.1 through 2.2.4 of this proposal. Since those objectives were described in substantial detail, this chapter will merely present a brief highlighting of the major deliverables that should result from the successful completion of those objectives. These are as follows:

- (1) RECON course needs identification questionnaire. With minor modifications, this questionnaire should be transportable to other NASA system needs analysis surveys.
- (2) Summary and analysis of RECON course needs analysis survey.
- (3) Complete transportable course materials for an integrated set of information system / NASA RECON courses, including standardized:
 - (a) Course syllabus.
 - (b) Course lesson plans.
 - (c) RECON homework assignments.
 - (d) RECON homework assignments - answer keys.
 - (e) RECON usage assignments.
 - (f) RECON usage assignments - answer keys.
 - (g) Course examinations.
 - (h) Course examinations - answer keys.
 - (i) Course visuals (transparencies).

- (4) Results of the experience of the pilot administration / teaching of each of these courses at multiple institutions.
- (5) Comprehensive evaluations of each project activity.
- (6) Comprehensive documentation of each project activity utilizing standardized and transportable documentation templates.

It is felt that this collection of expected project deliverables (and, in particular, the validated transportability of these deliverables across the two proposing institutions) will be of very significant benefit both to NASA and to the current and potential future NASA RECON user community.

V. PROJECT EVALUATION PLAN

It is our intent to conduct a thorough evaluation of each component of this proposed project. Our evaluation plan consists of a layered, multi-level evaluation philosophy wherein each activity within each project phase would be evaluated at least at activity completion time and, for major activities of substantial duration, also at appropriate break points within the activity; wherein each phase would be evaluated in its entirety at phase completion time as an integration of activity-level evaluations; and wherein the total project would be evaluated in its entirety at project completion time as a summarative integration of phase-level evaluations.

Throughout the entire project, evaluation results will be provided to the NASA contract monitor as they are available in a series of project interim reports and the project final report (see Chapter II for proposed contents and timing of such reports).

It is felt that the specificity provided within the identified specific objectives for each project phase (Needs Analysis: Section 2.2.1; Course Development: Section 2.2.2; Course Administration: Section 2.2.3; and Course Evaluation:

Section 2.2.4) will serve as an excellent baseline for the project evaluation plan. In fact, our evaluations will focus on evaluating our success in achieving each stated objective and on evaluating the transportability and generalizability of each of the deliverables resulting from these objectives.

One of the excellent advantages of this multi-institutional proposal (involving both the University of Southwestern Louisiana and Southern University) is that all of the project results and deliverables are guaranteed to be transportable between at least two institutions (for, if they are not, we would have failed miserably). Since there are many differences between these two proposing institutions, we must certainly develop all project products in a generalized and transportable manner from the very onset of the project. With this motivation, we fully expect that all of the deliverables that we produce as a result of this project work will be completely transportable to any college or university that currently has, or can be provided with access to the RECON system.

Based on the large number of funded grant and/or contract research projects that have been directed, either individually or jointly by the proposed Co-Principal Investigators for this project, we feel completely confident in the expected quality of our final deliverables and in our ability to thoroughly evaluate such deliverables.

VI. OVERVIEW OF INSTITUTIONAL RESOURCES

This chapter will present a very brief overview of the institutional resources and/or environments available at the proposing institutions and relevant to the scope of the proposed project. For the purposes of this proposal, information will be presented only in the following three areas: (1) Computer Science Department programs, students, and research activities; (2) University and Computer Science Department computing facilities; and (3) University science and engineering programs. Overview information will be presented for both the University of Southwestern Louisiana (USL) and Southern University (SU).

USL = Computer Science Department Programs, Students, and Research Activities

The Computer Science Department at USL offers degree programs at the B.S., M.S., and Ph.D. levels. Students majoring in Computer Science within the Department during the 1982-83 academic year included 1,012 majors at the B.S. level; 113 majors at the M.S. level; and 46 majors at the Ph.D. level.

The Department is extremely active in advanced research and development activities, having received numerous research grants from organizations such as the National Science Foundation, the

National Aeronautics and Space Administration, the Army Research Office, the Army Corps of Engineers, the Office of Naval Research, the North Atlantic Treaty Organization, Texas Instruments, and many others. All R&D activities in the information systems area are coordinated through the DBMS (Data Base Management System) Project, a large-scale R&D project founded in October, 1975 by the USL Co-Principal Investigator for this proposed project, and administered under the auspices of the Computer Science Department at USL.

USL = University and Computer Science Department Computing Facilities

The major University computing facility consists of a three processor Honeywell 68/80 MULTICS system with twelve megabytes of main memory. This is one of the most powerful and sophisticated contemporary time-sharing systems available. The Computer Science Department maintains a Departmental computer laboratory consisting of a variety of minicomputer and microcomputer systems. Additionally, the Department has recently received approval for the acquisition of two DEC VAX 11/780 systems, scheduled for installation in August, 1983.

USL - University Science and Engineering Programs

University programs in science and engineering are administered under the auspices of the College of Biological, Mathematical and Physical Science and the College of Engineering, respectively.

The College of Biological, Mathematical and Physical Sciences is comprised of the following Departments: Biology, Chemistry, Computer Science, Mathematics and Statistics, Microbiology, and Physics. The College of Engineering is comprised of the following Departments: Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, Geology, Mechanical Engineering, and Petroleum Engineering. With the exception of the Departments of Biology and Microbiology, the B.S. curricula for all of the above departments already require at least one course in Computer Science.

SU - Computer Science Department Programs, Students, and Research Activities

The Department of Computer Science at SU offers the B.S. Degree, with 350 majors during the 1982-83 academic year. Additionally, the Department has received approval to initiate an M.S. Degree program starting with the Fall Semester, 1983.

The Department has maintained a moderate program of research during its 15 year history, including research grants received from the National Aeronautics and Space Administration, Raytheon Data Systems Company, Proctor and Gamble, and Bell Laboratories. In addition, some teachers conduct unfunded research projects.

SU - University and Computer Science Department Computing Facilities

The major University computing facility consists of an IBM 4341 system with four megabytes of main memory which supports both batch and interactive environments for its users. The Department of Computer Science administers two computing laboratories, with a Raytheon Data Systems Programmable Terminal System 1200 (PTS/1200) minicomputer with 128 kilobytes of main memory in one laboratory, and a Burroughs Corporation B1855 computer system with 512 kilobytes of main memory in the other laboratory. There are currently two microcomputers in the Department, with eight additional ones scheduled to be delivered June 1, 1983.

SU - University Science and Engineering Programs

University programs in science and engineering are administered by the College of Sciences and the College of Engineering, respectively. The College of Sciences is comprised

| N A S A |

| 01/18/84 |

of the Departments of: Biology, Chemistry, Computer Science, Geography, Health Research, Mathematics, Physics, Psychology, Sociology, and Speech Pathology and Audiology. The College of Engineering is comprised of the Division of Technology and the Departments of: Architecture, Civil Engineering, Electrical Engineering, and Mechanical Engineering. Beginning with the Fall Semester, 1983, all areas referenced above will require a minimum of one course in Computer Science.

VII. PROPOSED PROJECT BUDGET, TIME SCHEDULE, AND PROJECT MANAGEMENT PLAN

The following three sub-sections of this chapter present respectively the proposed project budget, the proposed project time schedule, and the proposed project management plan.

7.1 Budget

The budget for the proposed project is presented on page 30. Various notes to the budget are explained below.

SALARIES AND WAGES:

Senior Personnel:

Wayne D. Dominick: \$4583/mo. (12 months at 40% time).
Leroy Roquemore: \$3789/mo. (12 months at 40% time).
(Salary increases of 15% for Year 2 are included.)

Other Professional Personnel:

USL Research Assistants: 2 at \$7200/yr.
SU Research Assistants: 2 at \$5800/yr.
(Salary increases of 10% for Year 2 are included.)

Non-Professional Personnel:

Secretarial-Clerical: 1/4-time at each institution at \$10000/yr.
(Salary increases of 10% for Year 2 are included.)

STAFF BENEFITS:

Staff benefit rate at USL is 11.3% of salaries and wages.
Staff benefit rate at SU is 13.0% of salaries and wages.

INDIRECT COSTS:

Indirect cost rate at USL is 47% of salaries and wages.
Indirect cost rate at SU is 45% of salaries and wages.

EXPENDABLE MATERIALS AND SUPPLIES:

Transparencies, terminal paper and ribbons, paper, etc.

TRAVEL:

Trips to NASA, Washington, D.C.:

6 person trips in Year 1 (3 each institution); 4 trips to attend RECON training sessions; 2 trips to present Year 1 reports to NASA. 4 person trips in Year 2 (2 each institution) to present Year 2 interim report and project final report to NASA. Travel at \$725/trip (air fare, motel (2 days), meals, taxi, etc.).

Trips Between Proposing Institutions:

24 person trips per year (12 each institution); 1 per month per institution. Travel at \$50/trip (car mileage, meals).

COMPUTER/COMMUNICATIONS COSTS:

Computer Terminals Purchase:

6 HP 2621B terminals (3 each institution) for RECON usage. Purchase price of \$2855/terminal. All terminal purchases will occur in Year 1.

Computer Terminal Maintenance:

Maintenance on 6 terminals (3 each institution) at \$32/mo. for 5 months during Year 1 and 12 months during Year 2.

Modem Lease Costs:

2 modems (1 each institution) at \$40/mo. lease for 5 months during Year 1 and 12 months during Year 2.

Cabling: Modems to Terminals:

6 terminals (3 each institution); \$70/terminal for cabling. One-time charge in Year 1.

Connect Time/Line Charges:

Year 1 will require 100 hours development time (50 hours each institution) and 44 hours instructional time for conduct of RECON workshops at each institution (22 hours each institution); total of 144 hours connect time/line charges in Year 1. Year 2 will require 1100 hours instructional time for conduct of RECON 6-week course and RECON 18-week course at each institution (550 hours each institution). Charge rates for components of connect time/line charges are as follows:

- * NASA Host System Connect Time: \$20/hr.
- * TELENET Line Charges: \$7/hr.
- * Telephone to TELENET Node Charges: \$20.21/hr
(for Band 5 WATS Line)

Local Word processing Costs:

Document preparation at each institution.

OTHER DIRECT COSTS:

Telephone:

Verbal communication between institutions and to NASA.

Photocopying/Postage:

Written communication between institutions and to NASA.

ORIGINAL PAGE IS
OF POOR QUALITY

B U D G E T

	Y E A R 1 10/01/83 - 09/30/84			Y E A R 2 10/01/84 - 09/30/85			T O T A L 10/01/83 - 09/30/85		
	USL	SU	TOTAL	USL	SU	TOTAL	USL	SU	TOTAL
SALARIES AND WAGES:									
Senior Personnel:									
Wayne D. Dominick	21998			25298			47296		
Leroy Roquemore		18187	40185		20915	46213		39102	86398
Other Professional Personnel:									
Research Assistants (4)	14400	11200	25600	15840	12320	28160	30240	23520	53760
Non-Professional Personnel:									
Secretarial-Clerical	2500	2500	5000	2750	2750	5500	5250	5250	10500
Total Salaries and Wages	38898	31887	70785	43888	35985	79873	82786	67872	150658
STAFF BENEFITS:									
USL: 11.3%									
SU : 13.0%	4395	4145	8540	4959	4678	9637	9354	8823	18177
TOTAL SALARIES, WAGES AND STAFF BENEFITS	43293	36032	79325	48847	40663	89510	92140	76695	168835
INDIRECT COSTS:									
USL: 47%									
SU : 45%	18282	14349	32631	20627	16193	36820	38909	30542	69451
EXPENDABLE MATERIALS AND SUPPLIES	1000	1000	2000	1500	1500	3000	2500	2500	5000
TRAVEL:									
Trips to NASA	2175	2175	4350	1450	1450	2900	3625	3625	7250
Trips Between Proposing Institutions	600	600	1200	600	600	1200	1200	1200	2400
Total Travel	2775	2775	5550	2050	2050	4100	4825	4825	9650
COMPUTER/COMMUNICATIONS COSTS:									
Computer Terminals Purchase	8565	8565	17130	0	0	0	8565	8565	17130
Computer Terminal Maintenance	480	480	960	1152	1152	2304	1632	1632	3264
Modem Lease Cost	200	200	400	480	480	960	680	680	1360
Cabling: Modems to Terminals	210	210	420	0	0	0	210	210	420
NASA Host System Connect Time	1440	1440	2880	11000	11000	22000	12440	12440	24880
TELENET Line Charges	504	504	1008	3850	3850	7700	4354	4354	8708
Telephone to TELENET Nodes	1455	1455	2910	11116	11116	22232	12571	12571	25142
Local Word Processing Costs	1000	1000	2000	1000	1000	2000	2000	2000	4000
Total Computer/Communications	13854	13854	27708	28598	28598	57196	42452	42452	84904
OTHER DIRECT COSTS:									
Telephone	500	500	1000	500	500	1000	1000	1000	2000
Photocopying/Postage	500	500	1000	1000	1000	2000	1500	1500	3000
Total Other Direct Costs	1000	1000	2000	1500	1500	3000	2500	2500	5000
TOTAL PROJECT COSTS	80204	69010	149214	103122	90504	193626	183326	159514	342840

7.2 Time Schedule

The time schedule for the proposed project is presented on page 32.

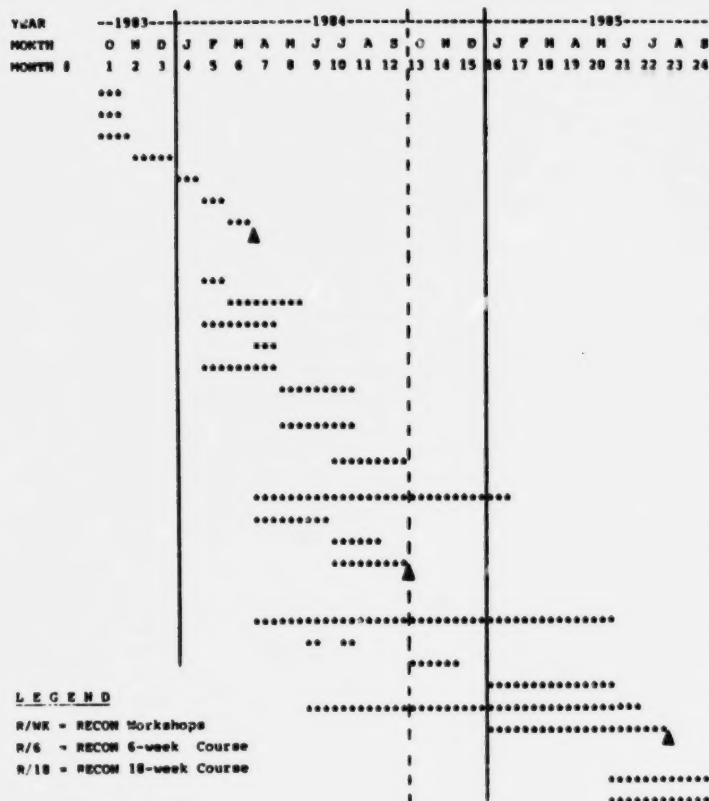
As illustrated in the time scheduling diagram, this project is proposed to span a period of two years, with an October 1, 1983 start date and a September 30, 1985 completion date.

Within the scheduling diagram, great care has been exerted to ensure that the scheduling of each project phase appropriately coincides with typical university academic year and semester periods in order to ensure compatibility of the proposed work with previously established university teaching schedules.

The diagram also illustrates the timing of the preparation and submission of the project interim reports and the project final report. Interim Report No. 1 occurs at the end of the sixth month and Interim Report No. 2, occurring at the end of the twelfth month, will also serve as the end of year 1 report. Interim Report No. 3 occurs at the end of the Course Administration Phase, and the final report occurs at the end of the twenty-fourth month.

ORIGINAL PAGE IS
OF POOR QUALITY

T I M E S C H E D U L E



7.3 Project Management Plan

The Co-Principal Investigators will assume both joint project-level responsibilities and individual institutional-level responsibilities.

From the standpoint of overall project management, the Co-Principal Investigator responsibilities will include overall project-level planning, control, monitoring of progress toward defined plans/schedules, budget administration, and coordination and integration of all institutional-level activities and deliverables. They will also be jointly responsible for the evaluation of all project methodologies and results, for the preparation of all interim reports and the final project report, and for all coordination with the funding agency.

From the standpoint of institutional-level project management, each Co-Principal Investigator will assume complete responsibility for the conduct of each project task at his respective institution. Each will also assume responsibility for ensuring that all of the tasks performed at his institution are completed in accordance with defined project-level standards concerning generalizability and transportability. Additionally,

each will serve as a project consultant to the other to assist in resolving any difficulties that may occur at one institution or the other.

In light of the developing nature of Southern University with respect to Computer Science research and development and the strong and proven expertise of the University of Southwestern Louisiana in such activities, it is felt that this joint project management plan is essential in order to ensure the success of this project.

VIII. SUMMARY OF PROPOSED PROJECT

This research and development proposal has addressed the development, administration, and evaluation of a set of transportable, college-level courses to educate science and engineering students in the effective use of automated scientific and technical information storage and retrieval systems, and, in particular, in the use of the NASA RECON system.

After a brief introduction to the research and development area in Chapter I, Chapter II identified the general and specific objectives for this project, with objectives being categorized as needs analysis objectives, course development objectives, course administration objectives, and course evaluation objectives. This collection of objectives is felt to represent an excellent structure and framework for the conduct of the proposed project.

Chapter III then outlined the proposed methodology to be employed in successfully accomplishing these objectives. Based on the success of numerous past and present joint grant activities between the proposing Co-Principal Investigators, this methodology is believed to be sound, realistic, and achievable within the scope of this project.

Chapter IV highlighted the expected project results and product deliverables associated with the completion of this project, and Chapter V presented the evaluation plan to be followed in order to ensure a comprehensive evaluation of all activities and deliverables proposed within the scope of the project.

Chapter VI presented a very brief overview of the institutional resources available at the proposing institutions to support this project. It is felt that these resources are more than adequate to provide an effective environment for the successful conduct of the proposed activities.

Chapter VII presented the proposed project budget, time schedule, and project management plan. Based on the magnitude of the activities and deliverables comprising this proposed project, it is felt that both the budgetary and the scheduling figures presented are most realistic.

Finally, resumes of the Co-Principal Investigators for this project are provided in the appendices to this proposal.

Both the University of Southwestern Louisiana and Southern University look forward to a favorable review of this proposal and to providing these services to the National Aeronautics and Space Administration.

| N A S A |

| 01/16/84 |

Resume

Wayne D. Dominick

03/83

Mailing Address

University of Southwestern Louisiana
Computer Science Department
P. O. Box 44330
Lafayette, Louisiana 70504
(318) 231-6604

Personal Statistics

United States Citizen
Birthdate : 19 October 1946
Birthplace: Chicago, Illinois

Position

Associate Professor of Computer Science, University of
Southwestern Louisiana, 1977-present.

Research & Development Interests

Planning and administration of information system environments
Management information system design
Data base management system design
Information storage and retrieval system design
Software monitoring and system performance evaluation
User/system interfacing
Interactive graphics for data base systems.

Education

B.S., Mathematics, Illinois Institute of Technology, 1968.
M.S., Computer Science, Northwestern University, 1974.
Ph.D., Computer Science, Northwestern University, 1975.

| DBMS.NASA/RECON-2 |

- 37 -

| PROPOSAL |

Wayne D. Dominick (Continued)

03/83

Other Professional Experience

Long Range Planning Consultant, Offices of Planning & Research, OCLC, Inc., Dublin, Oh., 1982-present.

Member and program/curriculum consultant, Graduate Program Advisory Council, Department of Computer Science, Southern University, Baton Rouge, La., 1982-present.

President, Executive Systems, Incorporated, Lafayette, La., 1981-present.

Computer systems performance measurement and evaluation consultant, Computer Systems Engineering Department, OCLC, Inc., Dublin, Oh., 1980-present.

Data base technology consultant, Tenneco Oil Exploration and Production, Houston, Texas, 1980-1981.

Information systems planning and development consultant, Development Division, OCLC, Inc., Dublin, Oh., 1980-present.

Computer assisted instruction consultant, College of Sciences, Southern University, Baton Rouge, La. (NSF Minority Institutions Science Improvement Program: Individualized Institutional Project Grant), 1980-present.

Reviewer, Annual Review of Information Science and Technology, 1980-present.

Scientific Services Program (STAS) consultant, Directorate of Training Development, U. S. Army Signal Center & Fort Gordon, Fort Gordon, Ga., (administered through Battelle Columbus Laboratories), 1979-1981.

Vice-President, Optimum Information Systems, Inc., Columbus, Oh., 1979-present.

Management information system consultant, State of Louisiana, Department of Education, Office of Research & Development, Baton Rouge, La., 1978-present.

Vice-President/Secretary, Information Management, Inc., Lafayette, La., 1978-present.

Member, Special Interest Group Steering Committee, ASIS, 1978-1979.

Information system monitoring consultant, Office of Research (formerly Research Department), OCLC, Inc., Dublin, Oh., 1978-present.

Grant Proposal Reviewer, National Science Foundation, Washington, D. C., 1978-present.

Book Reviewer, Journal of the American Society for Information Science, ASIS, 1978-present.

Chairman, Special Interest Group on Numeric Data Bases, ASIS, 1977-1978.

Chairman, Graduate Studies Committee, Computer Science

Wayne D. Dominick (Continued)

03/83

Department, University of Southwestern Louisiana, 1977-1979.
Member, Executive Committee, Computer Science Department,
University of Southwestern Louisiana, 1977-1982.
Assistant Professor of Computer Science, University of
Southwestern Louisiana, 1975-1977.
Chairman-elect, Special Interest Group on Numeric Data Bases,
ASIS, 1976-1977.
Newsletter editor, Special Interest Group on Numeric Data
Bases, ASIS, 1976-1977.
Speaker, USL Speakers Bureau, University of Southwestern
Louisiana, Lafayette, Louisiana, 1976-1981.
Data base system consultant, CODATA Task Group on Computer Use,
1976-present.
Curriculum and data base system consultant, Department of
Computer Science, Southern University, Baton Rouge, La. (HEW
Advanced Institutional Development Program Grant), 1976-1981.
Data base system consultant, Battelle Columbus Laboratories,
Columbus, Ohio, 1976-1977.
Data base management system and information storage and
retrieval system publications reviewer for major Computer
Science conferences, 1973-present.
Computer Science manuscript reviewer, Allyn and Bacon, Inc.,
Boston, Ma., 1976-present.
Founder and Director of the DBMS (Data Base Management System)
Project, University of Southwestern Louisiana, Lafayette,
La., 1975-present.
Energy Management Program Consultant, State of Louisiana,
Department of Conservation, Natural Resources and Energy
Division, Baton Rouge, La., 1975-1977.
U. S. Army Corps of Engineers Consultant, Champaign, Ill.,
Washington, D.C. and Vicksburg, Miss., 1975-1977.
Data base system consultant, Vogelback Computing Center,
Northwestern University, Evanston, Ill., 1975-1977.
Private consultant for management information system design,
Evanston, Ill. and Lafayette, La., 1971-present.
Royal E. Cabell Fellow, Department of Computer Science,
Northwestern University, Evanston, Ill., 1974-1975.
Information services programmer, Vogelback Computing Center,
Northwestern University, Evanston, Ill., 1971-1975.
Systems Analyst, U. S. Army Personnel Information Systems
Command, The Pentagon, Washington, D.C., 1969-1970.
Programmer, Department of Mathematics, Illinois Institute of
Technology, Chicago, Ill., 1967-1968.

Wayne D. Dominick (Continued)

03/83

Professional Societies

- American Society for Information Science (ASIS)
 - Special Interest Group on Numeric Data Bases (SIGNDB)
 - Special Interest Group on User On-Line Interaction (SIGUOI)
 - Special Interest Group on Education for Information Science (SIGNED)
- Association for Computing Machinery (ACM)
 - Special Interest Group on Management of Data (SIGMOD)
 - Special Interest Group on Information Retrieval (SIGIR)
 - Special Interest Group on Graphics (SIGGRAPH)
 - Special Interest Group on Measurement and Evaluation (SIGMETRICS)
- Human Factors Society (HFS)
- Computer Systems Group (CSG)

Publications

- "Developing Monitoring Techniques for an On-Line Information Retrieval System," (with B. Mittman), Information Storage and Retrieval: Theory and Practice, Vol. 9, No. 6, June, 1973, pp. 297-307.
- "Interactive Graphics Enhancements for Information Retrieval Systems," (with B. Mittman), Proc. ACM, 1973 Annual Conference, 1973, p. 434.
- "Information Retrieval System Cost/Performance Analysis via Interactive Graphics," (with B. Mittman), Proc. ASIS, Vol. 10, 1973 Annual Meeting, 1973.
- RIQS - (Remote Information Query System) Feature Analysis, Technical Report, Vogelback Computing Center, Northwestern University, Evanston, Ill., April, 1973, 45p.
- RIQS - Remote Information Query System Users Manual, (with L. Borman, R. Chalice, D. Dillaman, P. Kron), Technical Report, Vogelback Computing Center, Northwestern University, Evanston, Illinois, July, 1975, 262p.
- The Man/Machine Interface, System Monitoring and Performance Evaluation Methodology for On-Line Interactive Systems, M.S. Thesis, Department of Computer Science, Northwestern University, Evanston, Illinois, June, 1974, 98p.

Wayne D. Dominick (Continued)

03/83

The RIQSONLINE Monitor and RIQSLOG Data Analysis Project, (with R. Witt), Technical Report, Vogelback Computing Center, Northwestern University, Evanston, Illinois, August, 1974, 38p.

The RIQSONLINE Procedure Processing Capability, Technical Report, Vogelback Computing Center, Northwestern University, Evanston, Illinois, August, 1974, 14p.

The RIQSONLINE Interactive Graphics Package, Technical Report, Vogelback Computing Center, Northwestern University, Evanston, Illinois, August, 1974, 9p.

RIQSTUTOR - A CAI Tutorial for RIQSONLINE, Technical Report, Vogelback Computing Center, Northwestern University, Evanston, Illinois, August, 1974, 5p.

"Administrative Data Management in a University Environment," (with D. Mintzer), Personalized Data Base Systems, B. Mittman, L. Borman (editors), John Wiley & Sons, Inc., 1975, Chapter 9, pp. 169-185.

"System Performance Evaluation of Interactive Retrieval," in Personalized Data Base Systems, B. Mittman, L. Borman (editors), John Wiley & Sons, Inc., 1975, Chapter 12, pp. 216-227.

"Selective Retrieval, Statistical and Interactive Graphical Analysis of Skin Biopsy Data," (with F. Levit), Personalized Data Base Systems, B. Mittman, L. Borman (editors), John Wiley & Sons, Inc., 1975, Chapter 15, pp. 251-263.

Models for Graphically-Enhanced Data Base Management System Design, Ph.D. Dissertation, Department of Computer Science, Northwestern University, Evanston, Illinois, June, 1975, 214p.

"Personalized Management and Graphical Display of Data: An Extensible System Approach," (with L. Borman, R. Hay, Jr., P. Kron, B. Mittman), Proceedings of the Workshop on Data Bases for Interactive Design, Waterloo, Ontario, Canada, September, 1975, pp. 36-44.

Wayne D. Dominick (Continued)

03/83

"The DBMS Project - Interdisciplinary Research in Data Base Management Systems," Proceedings 1976 Meeting of the Louisiana Academy of Sciences, February 5-7, 1976, Baton Rouge, La.

"A Methodology for Designing Graphically-Enhanced Data Base Management Systems," Proceedings 1976 Meeting of the Louisiana Academy of Sciences, February 5-7, 1976, Baton Rouge, La.

"Automated Aids for Managing and Evaluating a Data Base System Environment," (with M. H. McKinney), Proceedings of the Fifth Biennial International CODATA Conference, University of Colorado, Boulder, Co., June 28 - July 1, 1976, pp. 497-499.

"User/System Interfacing in an Interactive Retrieval, Statistical and Graphical Analysis Environment," (with Lorraine Borman), Proceedings of the Fifth Mid-Year Meeting of the American Society for Information Science, May 20-22, 1976, pp. 34-49.

"I Speak as an Information Professional," ASIS Career Profile Contest winning paper presented at the Fifth Mid-Year Meeting of the American Society for Information Science, Vanderbilt University, Nashville, Tenn., May 20-22, 1976, 26p.

Evaluation of RIQS - Remote Information Query System, Technical Report CMPS-76-8-1, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, April, 1976, 44p.

Relational Data Base Management: Design Concepts and a Prototype System, (with Daniel W. Pipkins), Technical Report CMPS-76-8-2, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1976, 62p.

RDBMS - Relational Data Base Management System Users Manual, (with Daniel W. Pipkins), Technical Report CMPS-76-8-3, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1976, 24p.

Wayne D. Dominick (Continued)

03/83

CIS - Conference Information System Design Concepts. (with Ginger M. Chauvin and Christie D. Parker), Technical Report CMPS-76-6-4, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1976, Revision 1, May 1977, 87p.

Query Complexity in Data Base Management Systems. (with Charles R. Carmichael), Technical Report CMPS-76-6-5, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1976, 54p.

An Overview of DBMS Research: System Design, Monitoring and Evaluation. (with Sharad K. Agarwal), Technical Report CMPS-76-6-6, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, June, 1976, 77p.

Extensible Interfacing of Generalized Data Base Management and Graphics. Technical Report CMPS-76-6-7, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, Sept, 1976, 33p.

"The User Interface to Numeric Data Bases," *Proc. ASIS, 1976 Annual Meeting*, Vol. 13, 1976, p. 70.

Personalized Interfaces Among Users, Information Systems and Graphics Processing. Technical Report CMPS-76-6-8, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, November, 1976, 19p.

COMPAK: A General-Purpose Data Compression Package. (with Boris R. Bosch and Yeou L. Lin), Technical Report CMPS-76-6-9, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, December, 1976, 92p.

"Information Specification Processing by Use of Iterative Inference From a Meta-Base," (with Thomas Cousins and M. H. McKinney), *Summary in Proceedings of the Tenth Hawaii International Conference on Systems Sciences*, Honolulu, Hawaii, January 5-7, 1977, pp. 92-94; *Paper in Selected Papers in Management Information Systems, Tenth Hawaii International Conference on Systems Sciences Supplement*, pp. 10-15.

Wayne D. Dominick (Continued)

03/83

"Graphics Support for Data Base Management Systems," (with James R. Lee), Proceedings of the 1977 ACM Computer Science Conference, January 31 - February 2, 1977, p. 27.

"Optimizing and Evaluating Data Base Structuring on MULTICS," (with Glenn A. Shaffer and Sharad K. Agarwal), Proceedings of the 1977 ACM Computer Science Conference, January 31 - February 2, 1977, p. 23.

MADAM: Multics Approach to Data Access and Management Users Guide, (with Sharad K. Agarwal), Technical Report CMPS-77-8-1, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, January, 1977, 90p.

"Design and Implementation Considerations for Monitoring and Evaluating Information Systems," (with Joseph E. Urban), Proceedings of the 15th Annual Southeastern Regional ACM Conference, April 18-20, 1977, pp. 356-370.

"MADAM: Multics Approach to Data Access and Management," (with Sharad K. Agarwal), Proceedings of the 15th Annual Southeastern Regional ACM Conference, April 18-20, 1977, pp. 182-195.

A Relational and Network Database Access Language, (with Donald J. Simon and M. H. McKinney), Technical Report CMPS-77-8-2, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1977, 18p.

Preliminary Analyses of MADAM Versions 1-5, (with Howard G. Berg, Sharad K. Agarwal and Joseph E. Urban), Technical Report CMPS-77-8-3, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1977, 116p.

A Medical Records System: Foundations, Design and Implementation, (with Steven D. Higgins and Glenn A. Shaffer), Technical Report CMPS-77-8-4, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1977, 57p.

Wayne D. Dominick (Continued)

03/83

"Numeric Data Base Systems: Concepts and Capabilities,"
Collection of Papers of the Sixth Mid-Year Meeting of the
American Society for Information Science, May 19-21, 1977,
pp. 55-60.

Multiple Data Base Support for MADAM, (with Glenn A. Shaffer),
Technical Report CMPS-77-6-5, Computer Science Department,
University of Southwestern Louisiana, Lafayette, Louisiana,
June, 1977, 70p.

The DBMS Graphics Package, (with James R. Lee and Elie T.
Nassar), Technical Report CMPS-77-6-6, Computer Science
Department, University of Southwestern Louisiana, Lafayette,
Louisiana, June, 1977, 88p.

"User Interaction Monitoring as a Multi-Level Process," Proc.
ASIS, 1977 Annual Meeting, Vol. 14, 1977, p. 63.

"Information Systems for Minicomputers and Networks: A Course
Proposal for Computer Science Curricula," (with Glenn A.
Shaffer), Proceedings of the Eleventh Hawaii International
Conference on Systems Sciences, Honolulu, Hawaii, January
5-6, 1978, Volume II, pp. 180-208.

Multiple Data Base Support for MADAM: Phase II, (with Glenn A.
Shaffer and George A. Albracht), Technical Report
CMPS-78-6-1, Computer Science Department, University of
Southwestern Louisiana, Lafayette, Louisiana, January, 1978,
69p.

Proposed Research Addressing the Inferential Derivation of
Retrieval Semantics Utilizing a Relational View of a
Meta-Base, (with Thomas R. Cousins), Technical Report
CMPS-78-6-2, Computer Science Department, University of
Southwestern Louisiana, Lafayette, Louisiana, February, 1978,
37p.

"Techniques for Evaluating Computer-Based Systems for Numerical
Data Management," (with Joseph E. Urban), Proceedings of the
Sixth International CODATA Conference, Santa Flavia, Sicily,
May 22-25, 1978, pp. 371-375.

Wayne D. Dominick (Continued)

03/83

Profile Evaluation, Research and Modelling for Science Information Systems: A Report on the Development of a Generalized Evaluation Methodology to Study User Interaction. (with Lorraine Borman), Final Report, NSF Grant No. DSI78-19481, June, 1978, 258p.

Application of a Generalized Evaluation Methodology for Analyzing User Interactions with the MADAM System at the University of Southwestern Louisiana. (with Joseph E. Urban), Technical Report CMPS-78-6-3, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, September, 1978, 347p.

Hierarchical Thesaurus Processing for MADAM. (with Roger L. Patton), Technical Report CMPS-78-6-4, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, September, 1978, 41p.

The USL DBMS Project. Technical Report CMPS-78-6-5, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, September, 1978, 140p.

"The Management of Data Bases of Data Bases," (with Thomas R. Cousins), **Proceedings of the 1978 Annual Meeting of the American Society for Information Science**, Vol. 15, November 13-17, 1978, pp. 75-78.

"Interaction Monitoring Considerations Within Network-Based Information Systems," (with W. David Penniman), **North American Networking Collected Papers, Eighth Mid-Year Meeting of the American Society for Information Science**, Banff, Alberta, Canada, May 16-19, 1979, p. F4.

The University of Southwestern Louisiana NSF/RIAS-DBMS Working Paper Series. (Editor and Primary Author), Collection of Reports to the National Science Foundation by the University of Southwestern Louisiana under NSF Grant No. SER77-06835, 1978-1979.

The Design, Monitoring and Performance Evaluation of MADAM (Multics Approach to Data Access and Management). (with Sharad K. Agarwal), Technical Report CMPS-79-6-1, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, August, 1979, 214p.

Wayne D. Dominick (Continued)

03/83

A Proposed Monitoring Facility for the OCLC On-Line System. Research Journal No. 96, Research Department, OCLC, Inc., Columbus, Ohio, August 9, 1979, 98p. (OCLC internal proprietary document).

"Automated Monitoring to Support the Analysis and Evaluation Information Systems," (with W. David Penniman), Proceedings of the Second International Conference on Information Storage and Retrieval, ACM SIGIR FORUM, Vol. XIV, No. 2, September 27-28, 1979, pp. 2-9.

The Design, Implementation, and Usage of BDAP (Bibliographic Data Analysis Package). (with George S. Fissel, Jr. and Christie M. Davis), Technical Report CMPS-79-6-2, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, October, 1979, 206p.

The Design, Implementation, and Usage of an Automatic Data Validation Facility for MADAM Monitor Records. (with Sandeep V. Hemmady and Christie D. Michelsen), Technical Report CMPS-79-6-3, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, November, 1979, 55p.

Proposed Research Addressing the Objective Evaluation of IS&R/DBMS Systems Using Software Engineering Principles. (with Christie D. Michelsen), Technical Report CMPS-79-6-4, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, December, 1979, Revision 1, April, 1980, 77p.

An Overview of a Proposed Monitoring Facility for the Large-Scale, Network-Based OCLC On-Line System. (with W. David Penniman and James E. Rush), Research Report No. OCLC/OPR/RR-80/1, Research Department, Office of Planning and Research, OCLC, Inc., Columbus, Ohio, January 23, 1980, 22p.

"The Application of Software Engineering Principles to Existing Information Storage and Retrieval Systems," (with Christie M. Davis), presented at the 1980 Annual Meeting of the Louisiana Academy of Sciences, Hammond, La., February 8-9, 1980.

Wayne D. Dominick (Continued)

03/83

- "An Automated Monitor Data Validation Facility for the MADAM Information Storage and Retrieval System," (with Sandeep V. Hemmady and Christie M. Davis), presented at the 1980 Annual Meeting of the Louisiana Academy of Sciences, Hammond, La., February 8-9, 1980.
- "Performance Measurement and Evaluation of the MADAM Information Storage and Retrieval System," (with Peggy A. Nance and Christie M. Davis), presented at the 1980 Annual Meeting of the Louisiana Academy of Sciences, Hammond, La., February 8-9, 1980.
- "The Use of Software Engineering Techniques to Support Information System Evaluation," (with Christie M. Davis), Proceedings of the 1980 ACM Computer Science Conference, February 12-14, 1980, p. 43.
- "A Methodology for the Objective Evaluation of the User/System Interfaces of the MADAM System Using Software Engineering Principles," (with Christie D. Michelsen and Joseph E. Urban), Proceedings of the 18th Annual Southeastern Regional ACM Conference, Tallahassee, Fl., March 24-26, 1980, pp. 103-109.
- "Monitoring and Evaluation of On-Line Information System Usage," (with W. David Penniman), Information Processing and Management, Vol. 16, No. 1, 1980, pp. 17-35.
- The DBMS Statistical Analysis Package for MADAM, (with Peggy A. Nance and Christie D. Michelsen), Technical Report CMPS-80-6-2, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1980, 141p.
- The Design and Implementation of the MADAM Data Base Redefinition Subsystem, (with Mohtashim Naveed and Mohammad U. Farooq), Technical Report CMPS-80-6-3, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, May, 1980, 89p.
- "The Application of Monitor Data Analysis Techniques to Audit Trail Data From an On-Line System," (with W. David Penniman), Proceedings of the Ninth Mid-Year Meeting of the American Society for Information Science, Pittsburgh, Pa., May 15-17, 1980, (to appear).

Wayne D. Dominick (Continued)

03/83

"Applying Available Evaluation Functions to Information Programs and Services - Combining Theoretical and Pragmatic Approaches," (with W. David Penniman), Proceedings of the 43rd Annual Meeting of the American Society for Information Science, Anaheim, Ca., October 5-10, 1980, (to appear).

"Information System Monitoring and Analysis to Support the Evaluation of Computerized Access to On-Line Data Bases: Part I. Monitoring," (with W. David Penniman), presented at the 7th International CODATA Conference, Kyoto, Japan, October 8-11, 1980. Abstract in 7th International CODATA Conference Abstracts, CODATA Bulletin No. 37, July, 1980, p. 45, (full paper to appear).

"Information System Monitoring and Analysis to Support the Evaluation of Computerized Access to On-Line Data Bases: Part II. Analysis," (with W. David Penniman), presented at the 7th International CODATA Conference, Kyoto, Japan, October 8-11, 1980. Abstract in 7th International CODATA Conference Abstracts, CODATA Bulletin No. 37, July, 1980, p. 45, (full paper to appear).

MADAM User's Guide: Volume I = MADAM Users Manual, (with Christie D. Michelsen and Mohammad U. Farooq), Technical Report CMPS-80-6-4, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, December, 1980, Revision 1, January, 1982, 106p.

The Development of Management-Oriented Management Information Systems, (with Yu-Ping Chen), Technical Report CMPS-81-6-1, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, March, 1981, 33p.

The Design and Implementation of Macro Processing for the MADAM System, (with William M. Edwards), Technical Report CMPS-81-6-2, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, November, 1981, 72p.

The MADAM Software Monitor: Monitor Record Structure, (with Mohammad U. Farooq and Christie D. Michelsen), Technical Report CMPS-81-6-4, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, December, 1981, 38p.

Wayne D. Dominick (Continued)

03/83

The Design and Implementation of the MADAM System Administration Subsystem. (with Sandeep V. Hemmady and Mohammad U. Farooq), Technical Report CMPS-81-6-5, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, December, 1981, 55p.

"Generalized Database Management System Support for Numeric Database Environments," (with Peggy G. Weathers), Draxel Library Quarterly Special Issue on Numeric Databases, Vol. 18, Nos. 3 & 4, Summer-Fall, 1982, pp. 177-188.

"The Critical Role of User Education Within the Educational Information Systems Planning Process," (with Peggy G. Weathers), presented at the Twentieth Annual Convention of the Association for Educational Data Systems, Orlando, Florida, May 10-14, 1982, (to appear).

"On Developing Management-Oriented Management Information Systems," (with Yu-Ping Chen), Computer Research Journal = Transactions of TACS (Taiwan Association of Computer Science), Taiwan, Republic of China, Vol. 11, No. 1, January, 1982, pp. 53-74.

Internal Structure of a Computer Aided Oil Refinery Production Scheduling System. (with Yu-Ping Chen), Technical Report CMPS-82-6-2, Computer Science Department, University of Southwestern Louisiana, Lafayette, Louisiana, October, 1982, 75p.

"An Information System Performance Measurement and Evaluation Environment", (with Christie D. Michelsen), accepted for presentation at the 12th Mid-Year Meeting of the American Society for Information Science, to be held in Lexington, Kentucky, May 22-25, 1983, (to appear).

"Controlled Information System Usage Experiments to Support User/System Evaluations", (with Christie D. Michelsen), accepted for presentation at the 12th Mid-Year Meeting of the American Society for Information Science, to be held in Lexington, Kentucky, May 22-25, 1983, (to appear).

Wayne D. Dominick (Continued)

03/83

Miscellaneous

"DBMS Design Concepts," Keynote Address presented at the ACM Mid-Southeast Chapter Meeting, Chattanooga, Tenn., July 22-23, 1976.

Panelist, "Bibliographic and Numeric Data Bases -- A Comparison of the Online Interfaces," Special Interest Group on User On-Line Interaction and Special Interest Group on Numeric Data Bases, ASIS, 1976 Annual Meeting, San Francisco, Ca., October 5-9, 1976.

Invited Participant, Executive Seminar - Computer Usage in Management, Sperry Univac Corporation, Miami, Fl., October 17-19, 1976.

Session Co-Chairman (with Ronald R. Dueltgen) and Panelist, "Scientific Applications of Numeric Data Bases," Joint Session of the Special Interest Group on Biological and Chemical Information Systems and the Special Interest Group on Numeric Data Bases, Sixth Mid-Year Meeting of the American Society for Information Science, Syracuse, New York, May 19-21, 1977.

Panelist, "Design Considerations for Information Retrieval Systems," Sixth Mid-Year Meeting of the American Society for Information Science, Syracuse, New York, May 19-21, 1977.

Panelist, "Online User Monitoring to Improve User Interaction," Special Interest Group on User On-Line Interaction, 1977 Annual Meeting of the American Society for Information Science, Chicago, Illinois, September 26 - October 1, 1977.

Panelist, "Minicomputer Applications: Where Are We Heading?" Eleventh Hawaii International Conference on Systems Sciences, Honolulu, Hawaii, January 5-8, 1978.

Technical Program Chairman, American Society for Information Science, Special Interest Group on Numeric Data Bases, 1978 ASIS Mid-Year Meeting, May 22-24, 1978, Houston, Texas and 1978 ASIS Annual Meeting, November 13-17, 1978, New York, New York.

Wayne D. Dominick (Continued)

03/83

Session Chairman, "Techniques to Support the Management and Evaluation of Numeric Information Systems," Special Interest Group on Numeric Data Bases, Seventh Mid-Year Meeting of the American Society for Information Science, Houston, Texas, May 22-24, 1978.

First Invited Speaker, OCLC Distinguished Seminar Series, Research Department, OCLC, Inc., Columbus, Ohio, June, 1978.

Session Chairman, "Current Applications and Future Trends in Numeric Data Bases and Systems," Special Interest Group on Numeric Data Bases, 1978 Annual Meeting of the American Society for Information Science, New York, New York, November 13-17, 1978.

Keynote Speaker, "Computer Assisted Instruction Workshop," National Science Foundation, Minority Institutions Science Improvement Program, Southern University, Baton Rouge, Louisiana, June 2, 1980.

Keynote Speaker, "Computer Assisted Instruction Workshop," National Science Foundation, Minority Institutions Science Improvement Program, Southern University, Baton Rouge, Louisiana, June 8, 1981.

Keynote Speaker, Southern University Science Research Council Annual Meeting, Southern University, Baton Rouge, Louisiana, April 13, 1983.

Awards and Honors

Recipient, Outstanding Young Men of America Award, 1977.

Listed in Who's Who in the South and Southwest, 1978, 1979, 1980, 1981, 1982.

Listed in Personalities of the South, 1978-79, 1980-81.

Listed in Personalities of America, 1978-79.

Listed in Notable Americans, 1978-79.

Listed in Book of Honor, 1969-79.

Wayne D. Dominick (Continued)

03/83

Listed in American Men and Women of Science, 1979, 1982.

Listed in Men of Achievement, 1979-80.

Listed in the Dictionary of International Biography, 1979-80.

Listed in the American Business Registry, the American Educational Registry, and the American Scientific Registry, 1980.

University-Related Funded Grants/Contracts (Partial List)

"Service to Provide Information Storage and Retrieval for Dissemination of Information on Industrialized Buildings"

U. S. Army Corps of Engineers

Construction Engineering Research Laboratory

Champaign, Illinois

Contract Number: DACA88-74-C-0058

Principal Investigator for Northwestern Univ., Evanston, IL.

Funding: \$15,000.

Dates: June 26, 1974 - June 25, 1976.

"Interaction with Federal Data Banks"

Department of Conservation

Natural Resources & Energy Division

State of Louisiana

Baton Rouge, Louisiana

Energy Management Program #NRE-EM-75-11

Co-Principal Investigator

Funding: \$32,709.

Dates: December 1, 1975 - March 31, 1977.

"Information Storage and Retrieval System Evaluations"

U. S. Army Corps of Engineers

USAE Waterways Experiment Station

Vicksburg, Mississippi

Contract Number: DACW39-76-M-4232

Principal Investigator

Funding: \$3,000.

Dates: April 1, 1976 - April 30, 1976.

Wayne D. Dominick (Continued)

03/83

"Profile Evaluation, Research and Modeling for Science Information Systems"
Division of Science Information
National Science Foundation, Washington, DC.
Grant Number: DSI76-19481
Principal Investigator for The University of Southwestern Louisiana under subcontract to Northwestern University
Funding: Total: \$53,000. USL: \$20,284.
Dates: September 1, 1976 - June 30, 1978.

"Research Initiation and Support (areas of microcomputer systems, distributed networks and data base management systems)"
Division of Science Education Resources Improvement
National Science Foundation, Washington, DC.
Grant Number: SER77-06835
Investigator
Funding: \$178,700.
Dates: May 1, 1977 - July 31, 1980.

Eighth World Computer Congress - IFIP 80 - Travel Grant
National Science Foundation, Washington, DC and
American Federation of Information Processing Societies, Inc.
Funding: \$1,000.
Dates: October 8-9, 1980 (Tokyo, Japan).

Consultant on Funded Grants/Contracts (Partial List)

"Advanced Institutional Development Program"
U. S. Department of Health, Education and Welfare
Washington, DC.
Grant Number: G007602486
Southern University, Baton Rouge, Louisiana
Funding: \$3,000,000.
Dates: January 1, 1977 - June 30, 1981.

"Management Information System Consortium"
Elementary and Secondary Education Act, Title IV, Part C
Department of Education, State of Louisiana,
Baton Rouge, Louisiana
Project Number: 28-791096-0
Tangipahoa Parish School Board, Amite, Louisiana
Funding: \$149,200.
Dates: July 1, 1978 - June 30, 1979.

N A S A

01/18/84

Wayne D. Dominick (Continued)

03/83

"Minority Institutions Science Improvement Program:
Individualized Institutional Project"
Division of Science Education Resources Improvement
National Science Foundation, Washington, DC.
Grant Number: SER-7907407
College of Sciences, Southern University,
Baton Rouge, Louisiana
Funding: \$265,064.
Dates: August 1, 1979 - July 31, 1982.

DBMS.NASA/RECON-2

- 55 -

PROPOSAL

N A S A

01/16/84

Resume

Leroy Roquemore

03/83

Mailing Address

Southern University
Department of Computer Science
P. O. Box 10005
Baton Rouge, LA 70813
(504) 771-2060

Personal Statistics

United States Citizen
Birthdate : 4 April 1935
Birthplace: Columbia, Louisiana

Position

Associate Professor and Chairman, Department of Computer Science, Southern University, Baton Rouge, LA, 1973-present.

Research & Development Interests

Computer-Assisted Instruction
Modelling and Simulation
Software Monitoring and System Performance Evaluation
Data Base Management System Design

Education

B.S., Mathematics, Southern University, 1957.
M.S., Mathematics, Louisiana State University, 1963.
Ph.D., Computer Science, University of Southwestern Louisiana,
(Expected August, 1983).

Other Professional Experience

Co-Principal Investigator, "Minority Institutions Science Improvement Program," National Science Foundation, Grant Number: SER-7907407, College of Sciences, Southern University, Baton Rouge, Louisiana, Funding: \$265,064, August 1, 1979 - July 31, 1983.

DBMS.NASA/RECON-2

- 56 -

PROPOSAL

Leroy Roquemore (Continued)

03/83

Principal Investigator, "Information Systems Technology Study,"
National Aeronautics and Space Administration, Contract No.
NASW-33, 1981-1982.

Review Panlist, The National Educational Computing Conference,
1980-present.

College of Sciences Research Council, Southern University,
1980-present.

Review Panelist, Comprehensive Assistance to Undergraduate
Science Education (CAUSE), National Science Foundation,
1979-present.

Member, Systems Science Graduate Faculty, Louisiana State
University, 1979-present.

National Science Foundation Fellow, Louisiana State University,
1962-1963.

National Science Foundation Fellow, University of Kansas, 1961.

Graduate Assistant, University of Southwestern Louisiana,
1973-1974.

Associate Research Engineer, The Boeing Company, New Orleans,
Louisiana, 1963-1966.

Software Engineer, Western Electric, North Andover,
Massachusetts, 1967.

Project Director, Raytheon Data Systems Programmable Terminal
System 1200 Software Development Project, Southern
University, Baton Rouge, Louisiana, 1976-1981.

Leroy Roquemore (Continued)

03/83

Professional Societies

Association for Computing Machinery (ACM)
 Special Interest Group on Computer Science Education (SIGCSE)
 Special Interest Group on Computer Architecture (SIGARCH)
 Special Interest Group on Simulation and Modelling (SIGSIM)
 Special Interest Group on Computer Uses in Education (SIGCUE)
 Louisiana Academy of Sciences
 Data Processing Management Association

Publications

Bradley, H., Roquemore, L. "Effects of Computer-Assisted Instruction on the Quality of Education in Selected Science Courses," Research Paper, The Louisiana Academy of Sciences, 1983.

Bartley, I., Roquemore, L. "A Double Distribution Function for a Relational Data Base," Research Paper, The Louisiana Academy of Sciences, 1979.

Roquemore, L., Williard, M. "Information Systems Technology Study," Final Report, National Aeronautics and Space Administration, Washington, D.C., Contract Number: NASW-33, December, 1982.

Roquemore, L. "Raytheon Data Systems Programmable Terminal System 1200 Software Development Project," Final Report, Raytheon Data Systems Company, Norwood, Massachusetts, 1981.

Roquemore, L. "An Invitation to Bid for an Educational Computing System," Southern University, Baton Rouge, Louisiana, 1979.

Morrison, J. W., Prestage, J. J., and Roquemore, L. Computer Time-Sharing Feasibility Study, Department of H.E.W. (USOE), Washington, D.C., 1971.

"Calculation of a Theoretical Thrust Coefficient," Technical Paper, The Boeing Company, New Orleans, Louisiana, 1963.

"Trajectory Study of Particles from the Exhaust Plume of a Rocket Engine Which Impinge Upon and Cause Heating Problems on a Launch Pad," Technical Paper, The Boeing Company, New Orleans, Louisiana, 1963.

Leroy Roquemore (Continued)

03/83

"Problems Caused by Cavitation of a Fluid at the Inlet Ports of Turbo-Pumps," Technical Paper, The Boeing Company, New Orleans, Louisiana, 1963.

"Simulation of Stage Separation and Retro-Rocket Performance on a Space Vehicle," Technical Paper, The Boeing Company, 1963-65.

"Heat Stratification Across the Exhaust Plume from Combustion Chamber of a Rocket Engine During Steady-State Performance," Technical Paper, The Boeing Company, 1963-65.

"Simulation of Ignition, Start, Hold-Down, Lift-off, and Steady-State Performance of a Space Vehicle," Technical Paper, The Boeing Company, 1963-65.

"The Feasibility of Minuteman Rocket Strap-on to Increase Thrust and Specific Impulse for the Saturn Booster," Technical Paper, The Boeing Company, 1963-65.

"A Study of the Characteristics of a Film of Liquid Oxygen Left in a Tank which was Depleted by Turbo-Pumps," Technical Paper, The Boeing Company, 1963-1965.

APPENDIX C

STANDARDIZED COURSE MATERIAL DOCUMENTATION TEMPLATES

STANDARDIZED COURSE SYLLABUS TEMPLATE

- COURSE NAME:** Identification of the name of the course.
- OBJECTIVES:** Specification of the primary objectives of the course in terms of the information and/or experience to be imparted to students of the course.
- PREREQUISITES:** Specification of the basic prerequisites expected of prospective students of the course.
- SCHEDULING:** Specification of the duration of the course in terms of the number and type of instructor/student contact hours and/or laboratory hours.
- COURSE FORMAT:** Specification of the types of instructional formats to be employed in the course.
- REQUIREMENTS:** Specification of the requirements of the students in the course in terms of homework assignments, hands-on RECON usage assignments, examinations, and so on. For graded courses, percentage of final grade associated with each requirement is also specified.
- COURSE OVERVIEW:** Detailed specification of the major topics to be addressed within the course; breakdown of major topical areas into specific component subjects to be addressed; and specification of instructional duration for each major topical area.

REQUIRED READINGS: Specification of alternative required reading material and/or text(s) for the course.

POTENTIALLY REQUIRED READINGS: Specification of the types of reading material that may potentially be required within the course, depending upon instructor prerogative and/or availability of system (RECON) and data base documentation.

REFERENCE BIBLIOGRAPHY: Identification of the reference bibliography provided to support the course.

STANDARDIZED LESSON PLAN TEMPLATE

COURSE NAME: Identification of the name of the course.

LESSON NAME: Identification of the name of the lesson.

LESSON OBJECTIVE: Identification of the primary objectives of the lesson in terms of the information to be presented to the student within this lesson.

MEDIA AND EQUIPMENT: Identification of the presentation media and equipment to be used as part of presenting this lesson.

REFERENCES: Identification of the specific reference material to be employed in the preparation for, and presentation of this lesson.

METHOD OF PRESENTATION: Identification of the specific method(s) of instruction to be employed in the presentation of this lesson.

LENGTH OF LESSON: Identification of the number of instructional hours to be devoted to this lesson.

LEARNING OBJECTIVES: Identification of the specific learning objectives associated with this lesson in terms of the specific capabilities that the student will gain as a result of having taken this lesson.

PLAN FOR CONDUCTING THE LESSON: Identification of the major topical areas to be covered within this lesson; the order of their presentation; and the amount of time to be devoted to each such area.

ASSIGNMENTS: Identification of the specific out-of-class assignments associated with this lesson. Such assignments may include reading assignments, homework assignments, and/or RECON usage assignments, as appropriate.

STANDARDIZED HOMEWORK ASSIGNMENTS TEMPLATE

LEARNING OBJECTIVES: Textual description of the motivation for performing this homework assignment and the learning objectives associated with the assignment.

ASSIGNED TASKS: Identification of the specific tasks to be performed as part of this homework assignment.

STANDARDIZED HOMEWORK ASSIGNMENTS ANSWER KEY
TEMPLATE

ASSIGNED TASKS: Reiteration of the specific tasks to be performed as part of this homework assignment.

ANSWERS: Statement of correct answers to each assigned task/question.

STANDARDIZED USAGE ASSIGNMENTS TEMPLATE

LEARNING OBJECTIVES: Textual description of the motivation for performing this RECON usage assignment and the learning objectives associated with the assignment.

ASSIGNED TASKS: Identification of the specific tasks to be performed using RECON as part of this usage assignment.

STANDARDIZED USAGE ASSIGNMENTS ANSWER KEY TEMPLATE

ASSIGNED TASKS: Reiteration of the specific tasks to be performed using RECON as part of this usage assignment.

ANSWERS: For each assigned task, the full text of a series of user/system RECON interactions which results in the correct answer(s) to that task.

STANDARDIZED EXAMINATION TEMPLATE

BASIC CONTROL DATA: Identification of basic examination control data, e.g., type of examination (midterm, final, etc.), format of examination (open book, closed book, etc.), duration of examination, etc.

LESSON IDENTIFICATION: Identification of the course lesson(s) relevant to each question on the examination, to ensure coverage of the examination across all lessons comprising the course.

QUESTIONS: Statement of the questions comprising the examination.

STANDARDIZED EXAMINATION ANSWER KEY TEMPLATE

BASIC CONTROL DATA: Identification of basic examination control data (as above).

QUESTIONS: Reiteration of the questions comprising the examination.

ANSWERS: Statement of correct answers to each question.

VISUALS OBJECTIVES / GUIDELINES

- (1) The collection of course visuals will represent a complete and comprehensive presentation of the topical areas defined within the course syllabus.

- (2) The collection of course visuals will provide the framework whereby a qualified instructor can effectively teach the course utilizing the associated course syllabus, lesson plans, etc.
- (3) The collection of course visuals will provide the information necessary to enable a conscientious student to obtain a college-level understanding of the course material and to demonstrate this understanding as evidenced by acceptable performance on the course assignments and examination(s).